"SYNTHESIS, CHARACTERIZATION AND BIOACTIVITY OF SOME NITROGEN, OXYGEN AND SULFUR CONTAINING HETEROCYCLES"

SHORT RESUME OF THE PLAN PROPOSED FOR INVESTIGATION FOR Ph.D. DEGREE UNDER THE FACULTY OF SCIENCE

To be Submitted To

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By

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1. **Introduction**

In recent years heterocyclic compounds play an important role towards development of organic synthesis and their wide applications in medicinal chemistry. The ring system containing nitrogen, oxygen and sulfur as heteroatom has important role in many biological processes and as therapeutic agents. Heterocyclic intermediates are being used more and more in synthesis as protecting groups readily generated and readily removed. In biological world, heterocyclic compounds are everywhere; heterocycles formed the sites of reduction in many enzymes and coenzymes. Fused heterocycles shows broad occurrence in nature, particularly in biological systems like nucleic acid, hemoglobin, plant hormones and enzymes.

2. **Review of Literature**

Among the wide range of biological active heterocycles, a significant amount of research activity has been directed toward the study of pyrazolines, isooxazolines, 1,5-benzothiazepines, 1,5-benzodiazepines, flavonols etc. A number of derivatives have been found to exhibit physiological and pharmacological properties such as antiinflammatory[1-5], antibacterial[6-10], analgesic[11-14], antioxidant[15,1], antiallergic[16], antitubercular[17,7] antifungal[18,6], Antihistaminic [19], antidiabetic[20], antagonists[21], anti-HIV[22]. However, there are numerous examples of nitrogen containing heterocycles being used to treat TB for example Clofazimine, Isoniazid and Pyrazinamide. In view of these observations, promoted us towards the synthesis of novel heterocycles such as 2-Pyrazolines, Isooxazolines, 1,5-Benzodiazepines, 1,5-Benzothiazepines, flavonols etc.

3. **Objectives**

The objectives of the proposed research work are as follows

- Synthesis of halosubstituted aldehydes and ketones.
- The synthesis of some novel substituted chalcones from various substituted aldehydes and ketones.
- The synthesis of novel five membered heterocyclic compounds such as 2-Pyrazolines, Isooxazolines from corresponding chalcones.
- The synthesis of some six membered heterocyclic compounds such as flavones and flavonols.
- The synthesis of some seven membered heterocyclic compounds such as 1,5-benzothiazepines and 1,5-benzodiazepines.
- The spectral characterization of synthesized compounds.
- Biological evaluation of newly synthesized heterocyclic compounds.

4. **Methodology**

- The work starts with survey of review of literature by referring research books and journals.
- The reference work is further carried out by the discussion with different researcher, scientist and expertise of the proposed research work.
- To work on new methods for synthesis of Chalcones and heterocyclic compounds.

- The synthesis of pyrazolines, isooxazolines, benzothiazepines, benzodiazepines, flavonols and flavones.
- The characterization of newly synthesized heterocyclic compounds.
- The study of biological activity of synthesized heterocyclic compounds.
- The results, discussion and analysis of proposed work

5. Significance of the study

Heterocyclic compounds play important role towards the development of drug discovery. The study of biological properties of newly synthesized heterocyclic compounds is the main significance of the proposed research work.

6. Proposed work plan

Ist Year

- Literature survey
- Work on Iodination, chlorination and bromination of aldehyde and ketones
- Synthesis of some new chalcones from substituted aldehydes and ketones by Claisen-Schmidt condensation.
- Characterization and confirmation of structure by ^{1}H NMR, IR, ^{13}C NMR, MS and elemental analysis.

IInd Year

- Literature survey on synthesis of pyrazolines, isooxazoline and 1,5-benzothiazepines.
- Synthesis of some new pyrazolines, isooxazoline and 1,5-benzothiazepines from corresponding chalcones.
- Characterization and confirmation of structure by ^{1}H NMR, IR, ^{13}C NMR, MS and elemental analysis.
- Practice on writting skill the research article by referring the research paper of various reputed journals.
- Attending and presenting the research article in various national and international conferences, seminars, workshop and symposia.

IIIrd Year

- Literature survey on synthesis of 1,5-benzodiazepines, flavones and flavonols.
- Synthesis of some new of 1,5-benzodiazepines, flavones and flavonols from corresponding chalcones.
- Characterization and confirmation of structure by ^{1}H NMR, IR, ^{13}C NMR, MS and elemental analysis.
- Preparation and submission of research article to the reputed national and international journals.

- Study of biological evaluation of newly synthesized heterocyclic compounds against various bacterial and fungal pathogens.
- Preparation and submission of synopsis.

7. References

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